15¢

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

A SCIENCE SERVICE PUBLICATION

UNIV OF MICHIGAN
THE OBSERVATORY
ANN ARBOR, MICH.

AERONAUTICS

Man-Made Moon Possible

Once in position, gravity would keep it going. Could be used for television recording of enemy territory, measurement of cosmic rays.

➤ IT IS no secret that there has been serious consideration of the launching of an artificial "moon" of the earth, both for warfare and peaceful purposes.

There is no question that it can be done, given time, brains and money. The United States government was working on plans as early as 1945, as testimony at the New York atom spy trials made clear. But the Nazis had such a man-made satellite of the earth on their drawing boards. The Soviets, building on German captured information, hardly needed the espionage information they are supposed to have received to start them off on such a project.

In 1949 the annual report of the late Secretary of Defense Forrestal definitely mentioned an "earth satellite vehicle program."

One of the most attractive features of the satellite is that once it is projected into its position, by high-powered rockets, it would continuously circle the earth. And no fuel would be needed to keep the satellite circling the earth, just as the moon needs no power or fuel to keep going.

It would travel gravitationally at the same speed as the earth's surface beneath so that it would seem to stand still at one spot over the earth's equator.

The tiny object, much smaller than the moon of course, could be radio equipped and might have jet or rocket motors that would allow those on earth who gave birth to it to have some control over it even after it had been sent forth as an artificial heavenly body.

The big job will be to design the rockets sufficiently large and economical to allow the launching of the "space-platform," and projecting it safely and successfully into the proper position. This would take much larger rockets and higher speeds than have yet been achieved.

The extensive rocket research and testing, at White Sands, N. Mex., and elsewhere, is aimed undoubtedly at this development as well as rockets for sending atomic bombs over long-range earthly distances.

Perhaps speeds up to 10,000 to 20,000 miles per hour would be needed to defy the gravitational pull of the earth sufficiently. This would be most likely achieved by use of a multiple stage rocket, with the third one set off at about 300 miles up.

The distance above the earth for such a satellite would be about a minimum of 600 miles and might be thousands of miles. The size of the object would probably need to be relatively small, a few dozen feet in diameter, at least in the first attempts, because of the energy needed to project very much weight away from the earth. But there has been talk of relatively large "platforms" for eventual use, once such a satellite was demonstrated to be practical.

Military suggestions are that the satellite might be a launching point for atomic bombs and other weapons, but this would appear to be relatively fantastic and uneconomical compared with long-range bombers. There may be psychological value to an enemy controlling an artificial moon over our heads.

The man-made satellite could be used for observations, even automatic television recording of what is happening in an enemy country.

But the scientific uses of such an observation point in space, sending back radio reports from its automatic instruments, might far outweigh any miltary use. It would measure cosmic rays, observe the sun, chart the extremely rare gases in outer space and give us other information completely unobtainable from the surface of the earth.

Television might be sprayed over the whole earth from a series of such satellites that would receive and reflect radio waves from earthly stations. It was figured out that seven such man-made satellites spaced above the equator at an altitude of 4,000 miles could do the work of 1,500 surface television and FM radio stations needed to cover the entire United States.

How much money for an artificial moon? A billion or even a half billion dollars should give us one of them.

Science News Letter, March 24, 1951

AERONAUTICS

Better Air Control

➤ TRAFFIC control on the 70,000 miles of aerial "highways" criss-crossing the United States is now relatively effective with the use of modern electronic equipment, it was indicated by D. W. Nyrop, U. S. Administrator of Civil Aeronautics.

One of the big jobs of the Civil Aeronautics Administration, of which Mr. Nyrop is head, is to aid all types of planes to travel with relative safety along these airways, to reach their destination and make safe landings in all types of weather. He spoke as a guest of Watson Davis, director of Science Service, on Adventures in Science, heard over the Columbia network.

These aerial highways are numbered much like those for automobiles on the surface. They are uniformly ten miles wide. Each airway is a "multiple highway" system, he said, with separate "highways" one above the other at 1,000-foot intervals. Traffic along them, like traffic on the ground, follows the rule of "keep to the right."

Pilots of private planes can travel where they please in good weather when they can rely on their own vision to prevent collisions and other hazards. When bad weather closes in, all man-made things that fly, from small personal planes to superliners, move along these aerial highways.

The new omnirange system, now rapidly being installed throughout the nation, provides radio beams for pilots to follow. Unlike the older system it is replacing, it sends out guiding beams in all directions. They are very high frequency beams which are free of static interference. Many of them are now in use. A total of about 400 will soon blanket the entire United States. The omnirange will be standard airway range equipment after 1954.

Important also in traffic control are 30 stations which, together with some 200 airport control towers, keep track of planes in the air. In bad weather, pilots file flight plans before the takeoff. During flight they keep in touch with the control centers by radio. They follow flight instructions issued to them by the operators of the centers.

Science News Letter, March 24, 1951

ZOOLOGY

GI in Korea Sends Snakes to Smithsonian

➤ KOREAN secrets of nature are being disclosed by amateur scientists among the GI's fighting the Communists. One, Corp. William E. Old, Jr., Norfolk, Va., has sent back to the Smithsonian Institution a collection of little-known reptiles of the region.

Smithsonian experts explain that Korea has, in the past, been inadequately covered by zoologists. Corp. Old's collection may prove to have in it species hitherto unrecorded from Korea.

In a bomb-blasted schoolhouse, Corp. Old came across a small collection of reptiles, skilfully preserved in alcohol and well labeled, evidently by a native schoolteacher. It would have become part of the rubble of war if Corp. Old had not sent it to the natural history collection at the Smithsonian.

Science News Letter, March 24, 1951

MEDICINE

New Blood Factor

Finding of patient with stomach cancer whose blood was incompatible with that of over 900 donors, may give new approach to problem of cancer origin.

➤ BECAUSE the blood of more than 900 donors was incompatible with that of the patient, scientists may have a new approach to discovering the origin of cancer.

The patient in this case was a 66-year-old woman with stomach cancer. In preparing her for operation, her blood was typed and studied so that she could be given a transfusion to help her through the shock of the surgery. In the course of this ordinarily routine preparation, the incompatibility of her blood with that of over 900 other persons was found.

The reason for the incompatibility is a new factor in blood, called the Jarrell factor. It is one of three new blood factors announced by Dr. Philip Levine, director of the Rh Testing Laboratory of the Ortho Research Foundation, Raritan, N. J., at the New York Academy of Sciences.

The Jarrell factor is a dominant hereditary factor present in the blood of all individuals examined except the patient. It bears the patient's name because her case led to its discovery, although she does not have this factor in her blood.

She has an antibody to the Jarrell factor which is what makes her blood incompatible with blood from other donors tested. She might have developed this antibody as a result of transfusion with Jarrell blood, but she had not ever had any transfusion. She might have developed it during pregnancy as a result of Jarrell factor blood in her baby inherited from its father. But her last baby, born 32 years ago, was normal and did not have any sickness such as would have developed if its blood had been incompatible with the mother's.

The patient's cancer was considered the only possible source of the antibody to the Jarrell factor. Tests showed that cells from the cancer could absorb or remove the Jarrell antibody, but no other antibody, from the patient's blood serum.

The patient's parents did not have the Jarrell antibody, either. So apparently one single gene, or hereditary unit, mutated in the patient. The mutation was responsible for development of the Jarrell antibody and also, Dr. Levine thinks, for the development of the cancer.

She had in her cancer cells a factor everyone else has in their red blood cells but which she does not have in her red blood cells. The cancer immunized her to this factor, causing development of antibody to the Jarrell blood factor.

The case was brought to Dr. Levine's attention by Dr. Oliver B. Bobbitt, assistant professor of clinical pathology at the University of Virginia Hospital where the patient had gone for removal of the cancer.

Science News Letter, March 24, 1951

TO FIGHT EPIDEMICS—An epidemic control laboratory is installed on this LSI and will be used to battle epidemics in Korea. It is one of the most complete and compact disease research units ever assembled, including white mice and rabbits. In charge of the work with Korean natives is Lieut. Gerald A. Martin, MC, USN, who was brought up in Korea where his father taught medicine at Seoul University.

ASTRONOMY

New Star Appears In Archer Star Group

➤ A NOVA or exploding star has blazed forth in the southern sky, in the constellation of Sagittarius, the archer. Dr. G. Haro, assistant director of Mexico's National Astrophysical Observatory at Tonanzintla, Puebla, on March 7 discovered this "new star," the first to shine forth in 1951. His find has just been reported to Harvard Observatory.

The nova is of the ninth magnitude, and thus a small telescope would be needed to spot it. It is a morning star and so should be looked for in the early morning hours.

It is so far south that in the northern part of the United States it must be picked up close to the horizon; in the far north it probably will not be seen at all because of the haze. Observers in the south are more fortunate; there the exploding star will be fairly high in the morning sky.

Last April Sr. Haro found a faint nova in the constellation of Hydra, the water monster. In August he spotted a bright one, of 7.5 magnitude, in the constellation of Scorpio.

The newest "new star" is near the ecliptic, path the sun follows among the stars, close to the border between Sagittarius and Ophiuchus, the serpent holder.

Science News Letter, March 24, 1951

BACTERIOLOGY

Spring Plowing Odor Due to Organism

➤ THAT spring-like odor of freshly plowed soil is due to the same kind of organisms that produce streptomycin and other antibiotic drugs so useful in combatting disease.

Dr. Selman A. Waksman, the discoverer of streptomycin, can demonstrate the pleasant smell of these microscopic organisms, called actinomycetes, by letting visitors to his Rutgers University laboratories sniff the cultures from which the antibiotics are obtained.

The organisms, which some scientists classify among the bacteria and others among the molds, keep the soil free of dangerous disease-causing invaders by producing their antibiotic substances.

Science News Letter, March 24, 1951

BOTANY

Ancient Seeds Not Viable

Oldest historically dated seeds that have actually sprouted were 150 years old. In 70-year test, only two out of 60 kinds of seeds were still good.

➤ DESPITE the optimistic reports that two Indian lotus seeds reputed to be 50,000 years old have sprouted, you can raise an eyebrow over any claim that seeds more than a few hundred years old have remained alive.

The oldest historically dated seeds that have actually sprouted were in the British Museum for 150 years when a Nazi bomb caused them to be inadvertently tested for viability. Bomb damage allowed water to penetrate into the priceless type collections of the British herbarium, saturating the packing of the collection and providing right conditions for germination tests.

Two seed varieties, one of them the Indian lotus and the other the mimosa tree, sprouted after a century and a half of storage. As a result, botanists would not be surprised if such seeds did live even half a millenium. For the Indian lotus is one of the hardest and thickest shelled seed, which excludes the air and moisture that would speed up the life within the seed and exhaust it before sprouting conditions are right.

The length of life of seeds is economically important to farmers and gardeners and federal and state departments keep careful check on the growing ability of seed sold commercially. Whether seed is suitable for sale is determined by actual germination tests in most cases, rather than by the age of the seed. So much depends upon under what conditions the seed is kept. Soy beans may refuse to grow after even six weeks while another lot may sprout strongly even when ten years old. Wheat kept 32 years after drying over calcium chloride and sealed tight has sprouted, but generally wheat is dead after 10 years.

Two American experiments in seed longevity are recalled by Dr. E. H. Toole, senior physiologist of vegetable seed investigations at the U. S. Department of Agriculture in Washington. The government scientists buried seed at their old experimental station at Arlington, Va., which was destroyed to make way for the Pentagon building and other World War II structures. When this happened the test had continued for 39 years and 36 out of 100 seeds tested were still alive. Among them were jimson weed, morning glory, pokeweed, and tobacco. A still longer test is running at East Lansing, Mich. Begun in 1879, it was found that in 1949, which was 70 years later, only two out of 60 kinds of weed seeds were still good.

It may be possible to check the extremely long age of 50,000 years assigned to the sprouting Indian lotus seeds by a Japanese paleontologist by subjecting similar seeds, if they are available, to a test for radiocarbon content which determines age up to about 25,000 years. This method has been used successfully on various archaeological remains. The geological dating of material is subject to error because of the misdating of the earth in which the seeds are found or because the seeds have somehow found their way into older layers of the earth a few hundred years ago.

Science News Letter, March 24, 1951

Question Box

AERONAUTICS
How could a man-made moon be kept sailing around the earth? p. 178

BACTERIOLOGY
What gives freshly-plowed ground its spring-like odor? p. 179

BOTANY
How old can a seed be and still grow? p. 180
What study has thrown new light on photosynthesis? p. 189

GENERAL SCIENCE
Who is the first head of the National Science Foundation? p. 181

MEDICINE
In what manner was a new blood factor found? p. 179

METALLURGY
What will be an important source of iron for steel? p. 185

PHYSICS
Who received the first award of the Albert Einstein Medal? p. 183

PUBLIC HEALTH
What diseases might an enemy spread in biological warfare? p. 188
What precautions should be observed in using DDT? p. 184

ZOOLOGY
What new contribution has the Smithsonian Institution received from Korea? p. 178

Photographs: Cover, Fremont Davis; p. 179, Navy; p. 181, Fremont Davis; p. 183, Lewis L. Strauss; p. 187, U. S. D. A.

● RADIO

Saturday, March 31, 1951, 3:15-3:30 p.m., EST

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Russell M. Wilder, director, National Institute of Arthritis and Metabolic Diseases, Public Health Service, will discuss "Nutritional Quality of Foods."

SCIENCE NEWS LETTER
VOL. 59 MARCH 24, 1951 No. 12

45,100 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., NOrth 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Copyright, 1951, by Science Service, Inc. Republication of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service. Science Service also publishes CHEMISTRY (monthly) and THINGS of Science (monthly).

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1930. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAte 2-4822.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Edwin G. Conklin, Princeton University; Karl Lark-Horovitz, Purdue University; Kirtley F. Mather, Harvard University. Nominated by the National Academy of Science: Harlow Shapley, Harvard College Observatory; R. A. Millikan, California Institute of Technology; I. A. Maynard, Cornell University. Nominated by the National Research Council: Ross G. Harrison, Yale University; Alexander Wetmore, Secretary, Smithsonian Institution; Rene J. Dubos, Rockefeller Institute for Medical Research. Nominated by the Journalistic Profession: A. H. Kirchhofer, Buffalo Evening News; Neil H. Swanson, Baltimore Sun Papers; O. W. Riegel, Washington and Lee School of Journalism. Nominated by the E. W. Scripps Estate: H. L. Smithton, E. W. Scripps Trust; Frank R. Ford, Evansville Press; Charles E. Scripps, Scripps Howard Newspapers.

Officers—President: Harlow Shapley; Vice President and chairman of Executive Committee: Alexander Wetmore; Treasurer: O. W. Riegel; Secretary: Watson Davis.

Staff—Director: Watson Davis. Writers: Jane Stafford, A. C. Monahan, Marjorie Van de Water, Martha G. Morrow, Ann Ewing, Wadsworth Likely. Science Clubs of America: Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Sales and Advertising: Hallie Jenkins. Production: Priscilla Howe. In London: J. G. Feinberg.

GENERAL SCIENCE

Foundation Director

First head of National Science Foundation is pioneer in governmental support of fundamental scientific research. From ONR, was in OSRD during war.

➤ A PIONEER in governmental support of fundamental scientific research has been selected by President Truman to be first director of the National Science Foundation. He is Dr. Alan T. Waterman, 58, now deputy chief and chief scientist of the Office of Naval Research.

Dr. Waterman is a firm believer in the thesis that we cannot have progress without seeking out the fundamental secrets of nature. As chief civilian in the Navy's scientific effort, he has put that belief to work. He instituted for the first time in the government the practice of letting contracts to colleges and universites for projects in fundamental research.

Up until that time much fundamental research had been done by scientists working directly for civilian agencies of the government—the Bureau of Standards and the Department of Agriculture, to name only two. And, during the war, the Office of Scientific Research and Development had begun the practice of letting contracts in developmental research to universities. In this way much valuable work on new weapons and new materiels was done.

When he joined the ONR in 1946, Dr. Waterman, who held an important post with the OSRD during the war, applied to fundamental research that experience of letting contracts for developmental research to colleges.

The National Science Foundation was designed to further the search for basic knowledge. It is expected that it will have funds for research projects, funds to set up fellowships for producing new scientists. Under Dr. Waterman's guidance, the ONR came closest of any governmental research project to resembling what scientists hope the new Foundation will be.

An exciting example of the fundamental research being done by the Office of Naval Research under Dr. Waterman's leadership is the work in cosmic rays. These rays which enter our atmosphere from outer space are being studied to find out where they come from, what they are made of. The ONR is interested for a number of eminently practical reasons because the rays are particles of matter with great energy.

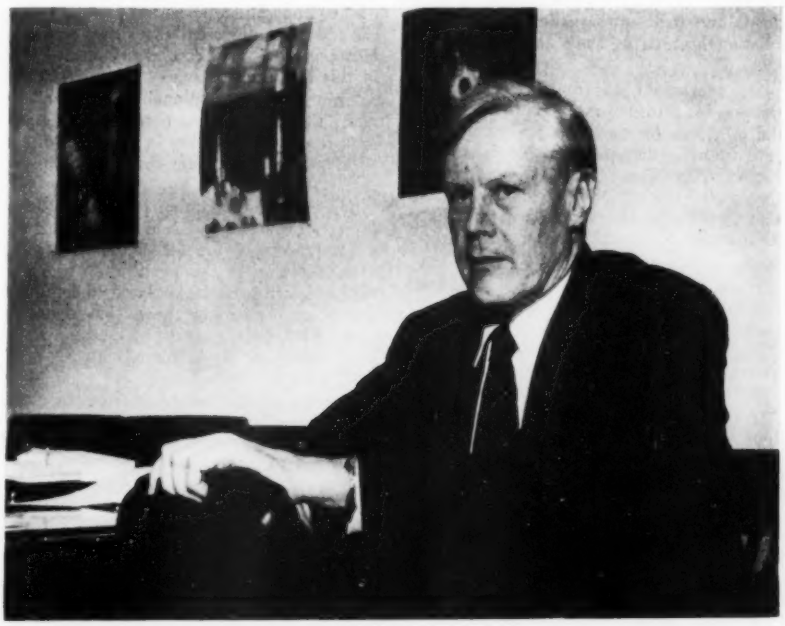
Though ONR comes closest to the scientists' conception of how government should operate in research, it has its limitations, even though they are broad. The projects for which contracts were let had to be justified by their potential usefulness to the government and its defenses. Some of those interesting side streets which appear in scientific research and which sometimes lead to vital discoveries, could not always be pursued with Navy money.

As director of the National Science Foundation, Dr. Waterman will not be bound by such considerations.

Dr. Waterman was educated at Princeton, receiving his Ph.D. in 1916. He is a physicist, having taught at Yale for almost 30 years. In 1942 he came into government service and shortly held an important position in the Office of Scientific Research and Development, the agency which directed the scientific end of the war effort. In 1946 he went to work for the Navy. He is married and has five children.

The National Science Foundation, of which Dr. Waterman is to be chief executive officer, has a board of 24 prominent scientists and other public figures. Its chairman is Harvard President James Conant. Last fall Congress appropriated $225,000 to get the Foundation going, but after July 1 Dr. Waterman and his board may have up to $15,000,000 to administer.

Science News Letter, March 24, 1951



FIRST DIRECTOR—Dr. Alan T. Waterman, of the Office of Naval Research, has been appointed as the first director of the National Science Foundation.

On This Week's Cover

➤ RISING from the cold earth of early spring is the charming flower of the bloodroot, perennial reminder of renewed life and hope.

The photograph on the front cover of this week's SCIENCE NEWS LETTER shows the pure white blossoms and heavily veined leaves of this low-growing wild flower. The buds shown will burst into full bloom overnight.

Science News Letter, March 24, 1951

INVENTION

Seesaw for One Given Patent

➤ THE LONELY, introspective child need no longer suffer the agonies of seeking out a partner for the teeter-totter. A one-person seesaw has been invented.

Harry S. Ray, Hollywood, Calif., received patent number 2,544,106, for a seesaw which one child can work by himself. The seesaw has a seat at only one end. On the horizontal bar on which the seesaw rests, there also are two vertical bars. A footrest and two handles are provided and, with these, the child can swing himself up and down, up and down, all alone.

Science News Letter, March 24, 1951

METEOROLOGY

Control of Rainmaking

Government agencies vie for control of rainmaking research and activities. Strict federal licensing procedures urged.

➤ STRICT FEDERAL control of all rainmaking activities was being urged by two of the original rainmakers, Drs. Vincent Schaefer and Bernard Vonnegut of the General Electric Company. They testified before a joint meeting of three Senate subcommittees considering bills which would place research and control in rainmaking in government hands.

However, Assistant Chief Willard F. McDonald of the U. S. Weather Bureau, who also testified, did not think such strict control was necessary. He advocated "relatively simple and economic regulatory procedure" which would provide only that "specified large-scale activities" be suitably controlled and reported to the national government.

Dr. Vonnegut declared that he believed nobody should be allowed to use silver iodide to seed clouds for rainmaking purposes but the government. As for dry ice, he believed that could be used by private persons with a licensing procedure.

The scientist pointed to three benefits which he said could come from a federal program: 1. Control over the weather, increasing and reducing precipitation where desirable, 2. Alleviation of damaging storms, floods and hail, and 3. Alleviation of such aviation hazards as icing and poor visibility.

Mr. McDonald was more reserved as to the possible future of rainmaking. He placed the emphasis on the need for much more research into the problem. He asked that such a research program be placed in the hands of the Weather Bureau, pointing out that the Weather Bureau is charged by law as the meteorological arm of the government.

None of the three bills being considered would place rainmaking directly under control of the Weather Bureau. One centers it in the Agriculture Department, another in Interior. The third, however, sets up a new, independent federal commission, patterned after the Atomic Energy Commission.

The Weather Bureau would be connected with this new commission only through the presence of the Secretary of Commerce as one of five commissioners.

The Interior Department has made a bid to Congress for control of all research and experiments in rainmaking and asked for the right to engage in a research program for turning sea water into pure water.

Secretary Oscar Chapman and Assistant Secretary William E. Warne were among the witnesses who testified on the rainmaking bills.

Little argument over Interior's jurisdiction over salt water purification was seen.

Assistant Secretary Warne, who is in charge of water and power development for the Interior Department, pointed out in his testimony that the Bonneville Power Administration, the Bureau of Reclamation, the Geological Survey and the Indian division—all in his department—have had an interest in research in rainmaking. He advocated that one department of the government handle such a research program, and that Interior be that department.

Mr. Warne also testified that the government should assume liability for damage done property as a result of such a research program.

As to regulation, Mr. Warne said that there were many hectic, unregulated operations in rainmaking going on, particularly in the West, and that these should be controlled.

Secretary Chapman, in advocating that his department be authorized to engage in an extensive research program in salt water purification, pointed out that during wartime the Armed Forces had developed purification apparatus sufficient to provide 1,000,000 men with their daily fresh water needs. However, he said, cost was not a factor in this operation.

"In the present national emergency," he said, "the need for additional domestic and industrial water supplies in the cities of the West may well become definite and pressing."

The Secretary said that present irrigation projects provided water to only about 21,000,000 acres of the 700,000,000 arid and semi-arid acres in this country. In much of that irrigated area, he declared, the ground water level is going down. To open up more land, new sources of water would eventually have to be found.

"Through development of economical methods for wholesale purification of ocean waters, new frontiers would be opened, not only in the western United States, but throughout the world," he told the Senators.

Science News Letter, March 24, 1951

MEDICINE

All Tumors Are Malignant or Benign

➤ MANY PERSONS are confused about the meaning of the word tumor. And when the doctor speaks of a benign tumor or a malignant tumor, they may be still further confused. Dr. Daniel Catlin of New York, in a report from the Medical Society of the County of New York, recently explained these words as follows:

"A tumor is any swelling or new growth occurring on or in the body. Tumors are lumps of living tissue which serve no useful function in the body and which may be harmful to good health.

"All tumors are divided into two groups, the benign and the malignant. A benign tumor is comparatively harmless; it grows slowly, pushes aside surrounding tissues, and does not spread to other parts of the body. A benign tumor is dangerous to life only when growing in some vital organ, such as the brain.

"A malignant tumor is a cancer. Unlike a benign tumor, a cancer can grow rapidly, destroy surrounding tissues, and often spread to distant parts of the body. A malignant tumor is dangerous to life wherever it may grow. Sometimes, it is very difficult to say whether a tumor is benign or malignant. Only thorough examination and special tests will determine the true nature of some tumors. The failure to distinguish between benign and malignant tumors in the early stages of growth may result in tragedy."

Going on to explain these malignant tumors, or cancers, he said:

"An early cancer is a solitary (or localized) malignant tumor which is often not too difficult to destroy. The early stage of cancer is a true emergency; prompt treatment is indicated. As a general rule, the earlier cancer is found, the more difficult it is to recognize. Failure of the patient to consult a physician and failure of the physician to recognize the signs of early cancer are two common causes of delay in receiving correct treatment. To cure an advanced cancer, which has already transferred tumor tissue to many parts of the body, is usually impossible. Unlike other important diseases, a cancer almost invariably causes the death of the patient unless it is completely removed or destroyed. The importance of early detection and early treatment cannot be overstressed; they are without doubt the most important factors in obtaining a cure."

Science News Letter, March 24, 1951

DENTISTRY

Magnetic False Teeth Are Held in Place

➤ EMBEDDING magnets in dentures is the idea of Ernst E. Goldschmidt, London, England. He received patent 2,543,773 for his invention which he claims will better hold dentures in their correct position in the mouth. He has designed dentures containing single and multiple artificial teeth and containing one or several magnets in different positions.

Science News Letter, March 24, 1951

PHYSICS

First Einstein Award

Medal established by Lewis L. Strauss in memory of his parents is given for work in mathematical physics and mathematical logic.

➤ THE FIRST Albert Einstein Award for achievement in the natural sciences has been won by Prof. Julian Schwinger of Harvard University, a mathematical physicist, and Prof. Kurt Godel, member of the Institute for Advanced Study, Princeton, N. J., a mathematical logician.

The awards were established by Lewis L. Strauss, president of the Board of Trustees of the Institute for Advanced Study and one of the original members of the Atomic Energy Commission, in memory of his parents, the late Lewis and Rosa Strauss, of Richmond, Va.

Formal presentation of the award took place at Princeton on March 14, on Dr. Einstein's seventy-second birthday.

The winners will divide the $15,000 prize and will receive a medal which has been designed by Gilroy Roberts, Philadelphia sculptor and engraver, who has done much medallic work for the United States mint.

The award committee consisted of Dr. Einstein, Dr. Robert Oppenheimer, director of the Institute for Advanced Study; Dr. John von Neumann and Dr. Hermann Weyl, both of the Institute for Advanced Study.

Prof. Schwinger has worked in the field of atomic physics. His most recent work has given science new understanding of the problem of interaction of light and matter and the properties of electrons and light. His calculations on the influence of self-energy on the hydrogen fine-structure and on the magnetic moment of the electron generally are regarded as a major advance in the understanding of quantum electrodynamics.

He developed new methods for the treatment of electro-magnetic waves. This formed the basis for much of the practical work with micro waves and had great civil and military significance. He originated new mathematical tools for the analysis of collisions, on which scientists depend heavily for understanding relations between elementary particles.

Early in his career he contributed many important suggestions about the structure of atomic nuclei and about many decisive experimental studies of nuclear interaction.

Dr. Godel's work in mathematical logic is regarded as one of the greatest contributions to the sciences in recent times. He was able to prove the existence in a properly codified mathematical system of propositions inherently "undecidable."

Following a broad study of the logic of provable and disprovable propositions, he made further notable contributions to science by proving that two of the axioms generally used by mathematicians, although frequently doubted, namely the "axiom of choice" and the "cantor continuum hypothesis", are consistent with the other axioms of set theory if these axioms are consistent.

He has gone deeply into the history of logical and scientific ideas. Although he has not published much on the subject, he is an authority on Leibniz. It was part of Leibniz' program for science to work out a symbolic logic of the sort which is now being developed and of which Dr. Godel is a leading protagonist.

Dr. Schwinger was born in New York City, Feb. 12, 1918, and received his A.B. and Ph.D. at Columbia University. He was a National Research Fellow at the University of California, instructor in physics at Purdue University and has lectured at the University of Michigan. He has been at Harvard since 1945 and Professor of Physics since 1947.

Dr. Godel was born in Brunn, Czechoslovakia, April 28, 1906. He received his Ph.D. in 1930 at the University of Vienna and taught at the University of Vienna from 1933 to 1938, when he came to the United States. In this country, he has been connected with the Institute for Advanced Study, of which he has been a permanent member since 1946. He has taken out his first naturalization papers.

Science News Letter, March 24, 1951

BIOLOGY

Cotton from Some Parts Reduced in Value

➤ COTTON from certain sections of the country is being attacked by increasing numbers of bacteria and fungi. The ravages of these micro-organisms are considerably reducing the cotton's value.

The damage is of importance to the manufacturer, the farmer and others concerned with cotton culture, J. P. Elting, of the Kendall Mills Research Laboratories, Paw Creek, N. C., points out (SCIENCE, March 16). In studying the increase in the amount of damaged cotton, he has found that the micro-organisms penetrate and swell the individual fibers, in some cases causing almost total destruction.

Officials at the Department of Agriculture state that the increase in micro-organism damage is probably a result of several causes. These include progressively earlier and earlier planting and harvesting of cotton, an effective way of avoiding insect ravages. A combination of hot and wet weather at the time the cotton bursts, plus the increased use of fertilizers, gives the best possible growth stimulant for the micro-organisms. Slow action of the micro-organisms, so that the damage is not recognized before milling, may also be a contributing cause.

Science News Letter, March 24, 1951

Several widely-grown *crops* of the temperate zone had their origin in tropical areas; included are tomatoes, peppers, sweetpotatoes, lima beans, eggplant and corn.

Modern *shoe-making*, from green hide to the finished footwear, uses some 300 materials in addition to the leather.

ALBERT EINSTEIN MEDAL—First award of this medal for achievement in the natural sciences was made to Prof. Julian Schwinger, of Harvard University, a mathematical physicist, and Prof. Kurt Godel, mathematical logician of the Institute for Advanced Study.

PHYSICS

Hunt More Industrial Uses for Atom Products

➤ MORE industrial uses for fission products from atomic piles are being searched out on a nation-wide scale by Stanford Research Institute in a study for the Atomic Energy Commission.

The plan is to let industries know how fission products can help them and to get some idea of the total of possible uses for these products.

Among the uses suggested for fission products are the sterilization of foods and drugs in containers without heat, production of fluorescent lights and of new types of luminescent paints and tiles, and tracing of pipeline flow.

Fission products are highly radioactive elements produced by the splitting of uranium in nuclear reactors. They are of no use for power, but their energetic radiations can kill certain organisms, cause chemical reactions, and penetrate solids.

Although these fission products are being used to a certain extent now by many industrial concerns, there are many unexplored possibilities. A booklet just issued by the Institute describes some of these possible uses as well as some of the problems, such as those of health and safety and disposal of radioactive wastes, that must be met when fission products are handled.

Science News Letter, March 24, 1951

PUBLIC HEALTH

Rules Given for Safe Use of DDT

➤ THE SEASON for fighting insects on farms, around the home and at camps and other recreation areas is beginning in some parts of the country and will soon arrive for all of us. Many will turn to DDT, that powerful insect killer developed during World War II which still is playing a big part in protecting our fighting men from disease-carrying lice and mosquitos.

DDT is a poison and some human deaths have been caused by it. But its poisonous effect decreases with the increasing complexity of the living organism exposed to it. Insects are destroyed by it, but more complex organisms such as human beings and the higher types of animals are "not likely" to be harmed, an American Medical Association committee reports.

When used wisely, DDT can be used safely. Some of the precautions given by the committee follow:

"DDT insecticides should never be stored in food cupboards or medicine chests where there is a likelihood of contamination of food or mistaken use. All exposed foods, utensils and working areas must be covered when kitchen and dining areas are being sprayed.

"Children's toys or cribs and rooms occupied by sick people should not be sprayed.

"Use of oil solutions on household pets should be avoided and DDT powders should be used only where they cannot be licked off. Intimate skin contact with aerosol discharge is to be avoided. Plants and aquariums in the home should be removed or covered before applying DDT sprays or aerosols.

"The use of oil solutions in the vicinity of open fires should be avoided because of the inflammability of such mixtures."

Science News Letter, March 24, 1951

CHEMISTRY

Carbon and Silicone Compounds Combine

➤ NEW chemicals which will undoubtedly provide useful materials of a kind not available today are foreshadowed in a communication from the Whitmore Laboratory of the Pennsylvania State College to the JOURNAL OF THE AMERICAN CHEMICAL SOCIETY (Feb.).

Related to the important silicone compounds, the new substances combine these materials with the older type carbon compounds in a newly discovered process. This reaction, which makes possible the synthesis of a large number of hitherto unavailable new-type organosiloxanes, is announced by L. H. Sommer, N. S. Marans, G. M. Goldberg, J. Rockett and R. P. Pioch of the college.

Combination of carbon with silicon by treating trimethylsilyl with sulfuric acid provides the starting point for the new materials. Carbon and silicon each form a large number of compounds, but have not hitherto been easy to combine with each other.

Science News Letter, March 24, 1951

EDUCATION

Train Mobile Teams To Battle Ignorance

➤ A TRAINING center for preparing teams of experts for the battle against ignorance will open soon in Patzcuaro, Mexico.

Each team prepared at the center will consist of experts in such fields as literacy, hygiene, home economics, practical farming methods and handcraft industries. Students will be trained under UNESCO grants and will return to their own countries to teach other teams. The idea is that these teams will be mobile, and will move about the country, working in remote regions in the fight against illness, poverty and illiteracy.

At the start, capacity of the center will be 50 students, of which ten will be Mexicans and 40 from other Latin American countries. Plans are to train more than 1,000 fundamental education specialists in 12 years. Opening of the center is announced in UNESCO COURIER (Feb.).

Science News Letter, March 24, 1951

IN SCIENCE

ZOOLOGY

True Wolf Fast Becoming Extinct

➤ THE WOLF is "staying away from our door" in increasingly large numbers. As a matter of fact, the true wolf is nearly extinct in this country.

Only a few of these creatures still remain in Minnesota, Wisconsin, Michigan and Oregon. Great numbers still exist, however, in Canada and Alaska. They are hunted down and killed whenever possible because they are a scourge to sheep and cattle.

Soon, all that will be left of these wolves in this country will be on exhibit—stuffed—at the Smithsonian Institution's U. S. National Museum. Mammalogists are now mounting pelts in settings simulating their native habitats.

The wolf once covered most of the Northern Hemisphere, but they have long since vanished from western Europe.

Science News Letter, March 24, 1951

INVENTION

Jet-Propelled Bomb Awarded New Patent

➤ NOW bombs as well as bombers can be jet-propelled. A jet-accelerated armor-piercing bomb was given a patent.

The inventors—Clarence N. Hickman, Jackson Heights, N. Y., Raymond L. Graumann, Alexandria, Va., and Rudolph F. Mallina, Hastings, N. Y.—point out that armor-piercing bombs ordinarily have to be dropped from great heights to achieve enough velocity to penetrate the plates of battleships and other armored targets. This decreases the chances of an accurate hit.

Their invention has been assigned to the Navy Department and to the Bell Telephone Laboratories. The jet impulse on the new bomb is produced by the rapid ejection of gases from a fast-burning propellant powder through a suitable nozzle attached to the body of the bomb.

In addition, a mechanism is provided for setting off the jet at a point in the trajectory of the bomb which will least affect its normal flight. Also included are safety devices so the jet propulsion will not go off prematurely.

The jet impulse, the inventors say, provides a suitable means for increasing the velocity of bombs dropped at a relatively low altitude. The inventors received patent 2,545,204 for their bomb.

Science News Letter, March 24, 1951

ENCE FIELDS

METALLURGY

Iron from Taconite May Be Source of Steel

➤ HIGH-GRADE iron ore from the mineral known as taconite, extracted by an improved process, may be America's principal source of steel in the future in spite of recently discovered high-grade ores in Labrador and Venezuela.

This prediction is made in Steelways Magazine, a publication of the American Iron and Steel Institute. Lake Superior high-grade reserves, which have supplied the nation with the greater part of its iron ore during the past several decades, is fast dwindling. Utilizing magnetic taconite will give a domestic supply.

The high-grade iron ores of the Mesabi region in Minnesota contain about 51% iron and require little or no processing. Taconite is an extremely hard rock and contains only about 25% iron.

In this improved extraction process, the taconite is reduced to a fine powder and the iron-bearing particles are concentrated by several magnetic separations. The resulting mud-like concentrate is then rolled into balls and baked hard to stand up in the blast furnace.

An advanced section of a plant near Babbitt, Minn., will be producing pellets by the end of this year, the Steelways article states. Plans are underway for a $70,000,000 plant to be built on Lake Superior at Beaver Bay, Minn. It is scheduled for completion by 1955, and will produce 2,500,000 tons of iron-rich pellets annually.

There are tremendous deposits of taconite close to the Mesabi region. They contain enough potential iron to supply the country's need for many generations to come.

Science News Letter, March 24, 1951

ENGINEERING

Nut Shells, Corncobs, Dry Ice Polish Metal

➤ NUT SHELLS, corncobs and dry ice are among strange materials now used to put mirror-like finishes on metal and non-metal machine parts at a fraction of the cost required by hand polishing.

The parts to be polished are put in a barrel together with the polishing materials, and the barrel rotated. The resultant rolling-tumbling action between the parts and the abrasive does the polishing. Quite heavy castings can be ground to remove fins and "flash" by the same method.

This tumbling process for polishing metals is not entirely new, but many new materials are now being used as abrasives, the American Society of Tool Engineers meeting in New York was told by Hubert M. Goldman of Ethone, Inc., New Haven, Conn., and Adolph Bregman, a consulting engineer of New York City. Among abrasive materials now employed are dry ice, nut shells, steel balls, cinders, cracked corn, ground corn cobs and sand. Each is useful in doing a different kind of job or producing a different degree of finish.

Dry ice, for instance, is now used to perform one of the rubber industry's most difficult jobs. It removes the fine molding "fins" from the edges of rubber products, they stated. The dry ice freezes the fins until they are brittle, and the tumbling action then breaks them away.

Machine tools which control themselves are important in modern manufacturing, J. M. Delfs, General Electric, Schenectady, N. Y., told these engineers who design the small and giant so-called tools used in modern plants. Not only do automatic machines increase output per worker but they do a better job for the machine operator, and with less fatigue and monotony. Product quality is often improved at the same time, he declared.

Science News Letter, March 24, 1951

CHEMISTRY

Pitzer Named as Alumnus of the Year

➤ KENNETH SANBORN PITZER, 37-year-old research director of the United States Atomic Energy Commission, has received the highest honor his fellow University of California alumni can bestow.

The "Alumnus of the Year" award was bestowed on Dr. Pitzer for his outstanding achievements of 1950. The award recognized him as top man, in terms of achievement, out of 150,000 University of California graduates, who are technically eligible for the award.

The young chemist received his Ph.D. at the University in 1937 and rose rapidly through the ranks of instructor, assistant professor, associate professor to full professor of chemistry at the University in 1945. He took leave of absence from the University in 1943 and 1944 to serve as research director of the Maryland Research Laboratory (Special Weapons Research). He was recipient of the American Chemical Society Award in Pure Chemistry in 1943 and 1949 was named one of the 10 most outstanding young men in the United States by the U. S. Junior Chamber of Commerce. In recognition of his achievements in the field of thermodynamics, he was awarded the Precision Scientific Company Award in Petroleum Chemistry in 1950.

Dr. Pitzer was appointed to the AEC post early in 1949 after the commission had conducted a critical survey of all leading physical chemists in the country.

Science News Letter, March 24, 1951

PHOTOGRAPHY

Aerial Camera Takes Large Area in Short Time

➤ AN AREA the size of Pennsylvania could be photographed in less than a day on one very large roll of film with a new aerial camera developed by Perkin-Elmer Corporation for the U. S. Air Force.

To accomplish this the plane would fly at a 40,000-foot altitude. The same job with older apparatus would require a battery of from two to five cameras. The heart of the new camera is a huge 90-pound glass prism that hangs beneath the lens of the camera and rotates in a semi-circle, scanning the earth below from horizon as much as 180 degrees if wanted.

The new instrument is called the Transverse Panoramic Camera. It successively photographs strips of terrain below and across the line of flight of the plane, from horizon to horizon. The film used is 18 inches wide and from 200 to 5,000 feet long. If used in a bomber type plane the camera could carry a film weighing up to 400 pounds. Each scan of the camera can give a picture 18 inches wide and from two to ten feet long depending upon the altitude of the aircraft.

This camera is in a fixed position in the plane and does not move. The rotating prism picks up the picture much as it would be done by a swinging mirror. The camera contains no shutter and operates by moving film over a slit, "wiping" an image of the terrain on the sensitized film as the airplane speeds over the ground.

By synchronizing the speed of the film to the ground speed of the plane a perfect picture is secured along the flight path. The instrument scans across the flight path of the plane, depending on successive sweeps of the prism to picture the flight path of the plane. These sweeps overlap to give a continuous scene.

The new camera was developed in cooperation with the Photographic Laboratory of the U. S. Air Force at Wright Field, Dayton, Ohio. Dr. James G. Baker of Harvard University proposed the new design.

Science News Letter, March 24, 1951

VITAL STATISTICS

Deaths at New Low, Births at High

➤ BIRTHS, deaths and baby deaths all established new records at the end of 1950. The nation's total death rate of 9.6 per 1,000 population and the infant death rate of 29.2 per 1,000 live births were the lowest in the history of the country.

Births, estimated at 3,699,000, were not far below the 3,699,940 registered for the record high in 1947. For the period 1946-1950 more babies were born in the United States than for any other five-year period in the nation's history, the National Office of Vital Statistics records show.

Science News Letter, March 24, 1951

HORTICULTURE

Plant Something New

This year's best gardens will include along with old favorites a few new vegetable varieties and also endive, broccoli or some other vegetable not previously planted.

By MARTHA G. MORROW

➤ THE BEST HOME gardens this year will include a few of the new vegetable varieties along with the old favorites.

Radishes, beets and peppers will be pretty much the same old stand-bys; some of the beans, tomatoes, onions, and squash will be recent developments. In addition, many back-yard and vacant-lot gardens will have a vegetable or two not previously planted, such as endive, broccoli and kohlrabi.

New vegetable varieties for your garden are constantly being developed by the U. S. Department of Agriculture, state research stations and commercial seedsmen. Sometimes these are noteworthy because of their overall high quality or high productivity—these you will want to try. Sometimes they are tailor-made to lick some particular disease, or to grow specially well in certain climates or in certain soils—consider local conditions before planting these.

Here is an up-to-date report of what vegetable breeders have developed for your garden and what they are working on to give you even better vegetables. But new varieties can not be created overnight and many of the old favorites are still the best.

Tomatoes in Every Garden

TOMATOES will be grown in almost every garden, be it large or small, in every state of the union. A number of good wilt-resistant varieties have been introduced within the past several years. Among the newest of these is the golden-yellow Sunray which became commercially available a year or two ago. The red-fruited Pan American gave Sunray its wilt-resistance, Jubilee is responsible for its yellow color.

Over most of the eastern United States, Rutgers, Marglobe and Pritchard are well-established, wilt-resistant varieties. On the Pacific Coast, particularly in California, Pearson is usually preferred.

In the cooler districts where the season is short, early, quick-growing varieties like Bounty and Victor are good. Plant them in other areas for a few early fruits, devoting up to a third of your tomato plot to them. Or if your garden is shaded part of the day by your house or trees, try these instead of the larger varieties. Stokesdale is a good second-early variety.

Several tomato breeders throughout the past decade have concentrated on licking such leaf diseases as curly-top, early blight, late blight and gray leaf spot. Wild species, worthless as tomatoes have been crossed with familiar garden varieties in the hope of producing a plant that combines resistance with the customary large, firm fruit, but progress is slow and difficult.

ONIONS are sensitive to weather, length of day, insects and disease, yet nearly every gardener tries to raise them. The greatest boon to onion growers is the recent working out of basic breeding principles, that make hybrid varieties practical.

By next year substantial quantities of first generation hybrid onion seed of many varieties suited to growth in different parts of the country will be available; this year only modest quantities of hybrid onion seed are on the market. Hybrid onions offer many of the same advantages as hybrid corn, now almost universally preferred.

Most Profitable

SNAP BEANS are among the most profitable crops that can be grown in the small garden, being generally quite productive at one or more seasons of the year. Two excellent varieties have been introduced in the past two years. Pods of Contender stand up better than those of Topcrop after harvest, so this variety is more popular for market. Topcrop, one of last year's All-America Selections, is mosaic resistant, productive, very tender and fleshy. But it makes its crop nearly all at once, so is best grown by those who freeze or can their own vegetables.

Resistance to blight, anthracnose, and virus diseases such as curly top are difficult objectives that experts who design new bean plants are trying to attain.

LIMA BEANS, an old garden favorite, are constantly being remodeled. Fordhook 242 and Early Market, introduced not many years ago, are of high quality and have large seeds. Peerless is a rather new small-seeded variety of high quality.

No resistance to specific diseases or pests has been bred into lima varieties now available, so bean breeders are trying to lick the mildew problem, bad in the East, and nematodes, a curse in the South and West. Every available variety at all closely kin to a lima bean is being tested. Some resistance has turned up, but to date no good disease-resistant variety has been announced.

CABBAGE should be included in all gardens except the very smallest, but plant only a few each of early, medium and late varieties to enjoy cabbage over a period of weeks. Golden Acre is an excellent early round cabbage for spring transplanting. Copenhagen Market and Glory, later varieties, should be planted in the spring. A fine mid-season variety is All Seasons, and in the North—where cabbage is grown for storage—Danish Ballhead is good.

For the last three decades agricultural experts have been hard at work developing disease-resistant counterparts of these cabbages. So today seedsmen offer Marion Market for early planting, the round Globe for second-early and somewhat flattened Wisconsin All Seasons for midseason use in areas where cabbage yellows tends to spoil the crop.

SPROUTING BROCCOLI, a comparatively new crop to American home gardens, is relatively easy to grow except during the hot summer months in the warmer parts of the country. Grown pretty much like cabbage, it is hardy to frost. Calabrese and several other strains of the Italian Green Sprouting type are universally good.

KOHLRABI, another member of the cabbage family, is also easy to grow in the spring and withstands cool weather well. Its edible part is the swollen, turnip-like stem. Early White Vienna is the principal variety, but don't plant too much at once—a row 15 to 20 feet long is all most families will want before it gets too old.

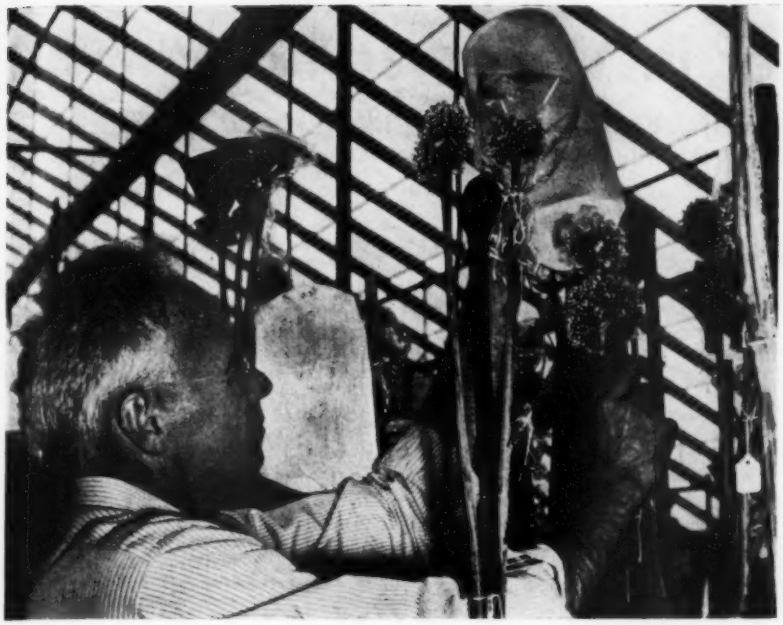
CUCUMBERS are universally popular, but have little food value and take up too much space in very small gardens. The white spined or slicing kind, such as you would grow in your garden, has been greatly improved in recent years.

Stays Green (also called Black Diamond), Early Fortune and Straight Eight are good, standard varieties. Be sure to let them get large enough, and harvest every two or three days to prevent the fruits becoming too old and to keep the plant producing. Some good hybrids, valuable because of their high productivity and vigorous growth, have been introduced by seedsmen within the last few years.

Bush Squash for Small Plot

BUSH SQUASH may be grown to advantage in small gardens. Soil and climatic requirements are the same as for cucumbers. Old favorites are various strains of yellow summer Straightneck, Cocozelle and White Bush Scallop. Uconn Squash, introduced last year, combines the fruit shape of Table Queen, a trailing squash, with the advantages of the bush habit of growth. Try it in your garden this summer.

SPINACH, though widely grown, is sensitive to heat and soil acidity. If the climate is mild enough for spinach to be carried over the winter (Baltimore south on the East coast), grow one of the mosaic-resistant strains like Virginia Savoy and Old



HYBRID ONIONS—Are available commercially this year because the basic breeding principles that make hybrid varieties practical were worked out by Dr. H. A. Jones of the U. S. Department of Agriculture, shown here putting into a cloth bag the flower heads of the two onion plants to be crossed.

Dominion. For spring planting, sow one of the Bloomsdale strains like Long-Standing Bloomsdale.

LEAF LETTUCE is a much safer bet than head lettuce. Slobolt is the most tolerant of the leaf lettuces to warm weather, although Grand Rapids and Black Seed Simpson grow well in many regions.

Most of the lettuce research today is being conducted on head lettuce in an attempt to give it resistance to heat, keep the heads firm and overcome tip burn. But just as Slobolt, an improved leaf lettuce, was a by-product of research on head lettuce, so will other desired characteristics be incorporated into leaf lettuce before head lettuce in many parts of the country can be recommended for any but the expert gardener.

ENDIVE is good as a fall salad plant for areas too warm for summer sowing of lettuce. A few dozen plants will keep a family well supplied with raw green stuff for weeks in the fall. It is grown in the south mainly as a fall and winter crop; in the north it can be grown throughout the summer and fall. Most popular of the broad-leaved kinds, often called escarole, are Broad Leaved Batavian and Full Heart Batavian; a good narrow, cut-leaved kind is Green Curled.

BEETS remain much the same year after year, but they are always good. Slightly flattened or globular varieties are the most popular, Crosby Egyptian and Detroit Dark Red being reliable stand-bys.

Garden beets are generally damaged little by insects and disease. But in the intermountain sections they are attacked by a virus disease called curly top, carried by a leafhopper.

To date no curly-top resistant garden beets are available. But they are on the way, though probably still many years distant.

PEPPERS, although not a major article of food, are included in many gardens. A dozen or so plants is often sufficient. Worldbeater, California Wonder and Ruby King can be grown throughout most of the country. In the cooler districts such early varieties as Windsor A and Early Giant are good.

SPRING RADISHES are appetizing tidbits, but should be sown at intervals of a week to ten days, only a few feet in the row being planted each time. Ready for use quicker than other vegetables (they require but three to four weeks to mature), they remain edible only a short time. Scarlot Globe, Sparkler and Scarlet Turnip are popular small, round radishes.

SWEETCORN, most of which grown today is hybrid, SWEET and IRISH POTATOES, and WINTER SQUASH are grown only in the larger of the home gardens. If the plot is 30 by 50 feet or less these vegetables would probably take up too much room.

Seed of a cucumber, excellent of its type, and a hybrid cucumber of high productivity and vigorous growth have been collected for you by Science Service so you can see for yourself how plant breeders improve upon familiar garden varieties. Likewise seed of a lovely marigold and of the Glitters Marigold, one of this year's All-America Selections, have been secured so you can see for yourself just how these are remodeled. For the nominal fee of 50 cents you can receive packets of seeds of two cucumber varieties and two marigold varieties along with full details about how to grow them. Just write Science Service, 1719 N St., N. W., Washington 6, D. C., and ask for the kit on 1951 Seeds.

Science News Letter, March 24, 1951

Radar-equipped vessels can move almost as freely through harbors and narrow rivers in dense fog as they can in clear weather.

European tree *sparrows*, a different bird from the common English sparrow, were released in a city park at St. Louis in 1870 and have never wandered far from that area.

For YOU—A QUICK EASY WAY TO
LEARN A LANGUAGE
for • PROFESSIONAL, SCIENTIFIC AND EDUCATIONAL ADVANCEMENT!
• Greater Business Opportunities!
• Doubled Travel Enjoyment!
• Wider Social and Cultural Horizons!
What do you want to learn . . French, Spanish, Russian, German or an Oriental language? With a LINGUAPHONE you can learn any one of 29 languages, in just 20 minutes a day!
BUSINESS
TRAVEL
CULTURAL
EDUCATION
ARMED SERVICES
LINGUAPHONE
World's Standard Conversational Method
is the natural way to learn a language . . actually the same way you learned English even before you went to school. You hear people SPEAK in their native tongue. You listen—you learn—you understand! You SPEAK with correct pronunciation, proper tonal inflection. You learn to read and write. It's all amazingly easy!
In peace or war another language can mean power, promotion, a better job, more pay, greater opportunities and cultural enjoyment to you. When traveling, you'll be able to see and do things the native way. If you're in a profession, a scientist, student or teacher, another language is a valuable asset for greater achievement.
SPANISH FRENCH RUSSIAN GERMAN
—any of 29 languages incl. Oriental
LINGUAPHONE INSTITUTE
3103 Rockefeller Plaza, N. Y. 20
Free book gives fascinating facts about LINGUAPHONE—why it is used by U.N., I.L.O., colleges, schools, armed services—choice of more than one million home study students. Mail Coupon TODAY!
SEND FOR FREE BOOKLET
LINGUAPHONE INSTITUTE
3103 Rockefeller Plaza, N.Y. 20
Send me your FREE book.
I want to learn..... language.
Name .....
Address .....
City .....
☐ Check if eligible under G.I. Bill of Rights

PUBLIC HEALTH

Disease Danger in War

Plague, cholera, typhus fever, smallpox, rabbit fever, anthrax and glanders are among the ills that an enemy might spread.

► PLAGUE, cholera, typhus fever, smallpox, rabbit fever, anthrax and glanders are among the diseases an enemy might try to spread in our country if he wanted to use germ warfare against us.

These diseases are named in the federal government's official booklet, WHAT YOU SHOULD KNOW ABOUT BIOLOGICAL WARFARE. It is almost the first time diseases are named in any official publication in this connection.

Biological warfare is the technical name for germ warfare. BW is its short name. BW attacks may be made against people, against domestic animals such as cattle and poultry, or against food crop plants.

BW weapons include "living agents," such as bacteria, viruses and other disease-causing things. They include toxins, which are the special kinds of poisons produced by living things. Botulinus toxin, cause of botulism, is one such poison. Tetanus toxin, cause of lockjaw, is another.

BW weapons also include chemicals known as artificial hormones or growth regulators which can kill plants. Some weed killers now in use are chemicals of this sort developed as possible BW weapons during World War II.

BW weapons could be spread through fine sprays or mists such as come from the bathroom atomizer or a DDT bomb or spray gun. These sprays are called aerosols.

Big ones, for major BW attacks, "could be loosed from special sprayers carried in airplanes, if an enemy could succeed in making an attack pretty close to the ground. Or the aerosol machines might be carried aboard submarines," the BW booklet states.

"Biological warfare is no secret super-weapon," the booklet declares. "There are defenses against it."

Defenses exist in the health and agriculture departments, federal and local, which keep our water, milk and food free from germs and poisons and which keep out of our country infected people, animals and plants or their products that might spread disease.

Vaccines and medicines, such as the sulfa drugs and penicillin, are other defenses against BW.

The difficulty of spreading disease germs among large numbers of people makes a kind of defense against BW.

The fact that some people have resistance to one or another of the disease germs and can throw them off without getting sick gives another kind of defense. Even during the 1918-1919 influenza epidemic, probably the worst epidemic of modern times, not everyone got sick.

The BW booklet can be obtained from the U. S. Government Printing Office, Washington 25, D. C., for 10 cents.

Science News Letter, March 24, 1951

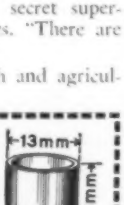
SIX SURVIVAL SECRETS

Biological warfare defense instructions issued by the federal government advise:

1. Keep yourself and your home clean.
2. Report sickness promptly.
3. Give all possible help to authorities.
4. Don't rush outside right after a bombing.
5. Don't take chances with food and water in open containers.
6. Don't start wild rumors—don't believe wild stories.

CARGILLE MICRO BEAKERS

Glass.....Capacity 1ml
For weighing small quantities of materials for analysis.
For semi-micro procedures
Useful for many reactions and tests—saving space, time, material.
15 for $1.00 Dept. S Gross $7.50



INDEX OF REFRACTION LIQUIDS

For Identification of Minerals & other Solids by the Immersion Method of Microscopy
Range 1.400-1.700, intervals of 0.002 or as selected. Index certified to 0.0002
Range 1.71-1.83, intervals of 0.01
Write for Price List Nd-SNL

R. P. CARGILLE
118 Liberty Street New York 6, N. Y.

ENGINEERING

Multiplex Without Errors

► NO ERRORS in messages transmitted by radio telegraphy will occur with the use of a new RCA Electronic Multiplex and associated apparatus, Naval Academy advanced students were told by Sidney Sparks of RCA Communications, Inc.

The associated apparatus is known as ARQ, the "A" standing for "automatic." Atmospheric disturbances and equipment failures have been among the causes of undetected errors in encoded messages, Mr. Sparks stated. The combination of these two devices, he said, "reduce almost to the vanishing point the risk of undetected errors that might destroy or radically change the meaning of encoded messages."

Electronic Multiplex provides four channels of high-speed wireless communication on a single radio frequency. These channels can handle an unlimited volume of coded or straight traffic, he declared. The new model is entirely electronic, and represents a great advance over earlier types.

The Automatic RQ, which operates with the Multiplex system, converts transmitted signals into a type of code which permits positive detection of error. At the receiving end it translated the characters back into the standard five-unit teleprinter code after performing an automatic check.

A signal distortion in this system produces an unprintable combination rather than one that might result in the printing of a false character. If such a signal is received, the device automatically flashes back to the sending station a signal which stops the transmitter and causes it to repeat the distorted character. It will continue to do this until the character is correctly received and printed.

Science News Letter, March 24, 1951

STANDARDS

Government Colors Reduced from 500 to 187

► GOVERNMENT PAINTING, from office walls to battleships, is now limited to 187 colors, reduced from 500 colors previously used. This is the result of a recent Federal Specification which standardizes and limits the colors of paints that may be used in the Federal services. (FEDERAL SPECIFICATION COLORS: READY MIXED PAINT).

To ease the job of purchasing agents for various agencies, a color card book in loose leaf form has been prepared under sponsorship of the General Services Administration, and is available at $4.50 a copy from the Government Printing Office.

The book consists of deposits of stain and fade-proof color squares on paper, grouping the 187 colors in three classifications of gloss, semi-gloss and lustreless. Studies leading to the specifications were made by representatives of the General Services Administration, National Bureau of Standards, and government users of paint.

The Federal government expends about $100,000,000 a year for paint. By settling upon fewer colors money will be saved because inventories carried will be much smaller, and agencies will be able to exchange excess quantities.

Science News Letter, March 24, 1951

BOTANY

Photosynthesis Clue

Problem of how plants make food is a step nearer solution as the result of research using carbon 14 to trace food of photosynthetic bacteria.

▶ THE PROBLEM of how plants manufacture food by alternate use of light and darkness has been brought one step nearer solution, Drs. Martin D. Kamen, Samuel J. Ajl, Stanley L. Ranson and Jack M. Siegel, of the Washington University Medical School, St. Louis, report to the journal, SCIENCE (March 16).

Working in the university's departments of radiology and bacteriology, the doctors have used radioactive carbon 14 to trace the path of different parts of food compounds fed to photosynthetic bacteria, and found that their fate differs when fed in a dark room or in the light. Little difference is observed in the dark whether the labelled carbon 14 was originally in one part of the compound or another. But when the bacterium, *Rhodospirillum rubrum,* is allowed to carry on its activities in the light, a difference is noted in the products it manufactures from the individual parts of the food compound.

During the hours of darkness, the organism seems to build carbon into its structure in the form recognized by chemists as carbonate. During the period when light shines on it, more direct assimilation of carbon into more complex compounds is carried on. Researches to follow this compound building further are being continued by the research team.

Science News Letter, March 24, 1951

MEDICINE

Gland Chemicals for Aged

ACTH and cortisone are good medicine even for those who do not have painful arthritis. Will help those with injuries to get up and about sooner.

▶ ACTH and cortisone are good medicines for old people even if they do not have painful crippling arthritis. This is the complaint for which these gland chemicals have mainly been used in the two years since their discovery.

The new use of these chemicals and a way to make a small dose of the scarce supply go farther was reported by Dr. George Thorn, Harvard medical professor, at a conference sponsored by Smith, Kline and French Laboratories, Philadelphia pharmaceutical firm.

Dr. Thorn suggested ACTH and cortisone for old people who have suffered painful injuries which did not involve broken bones but which would keep them in bed when it would be better to have them up and about. A five- or ten-day course of the gland chemical treatment will help get them up and moving sooner, he finds.

Old patients who are poor risks for surgery can be given a short course of ACTH or cortisone to get them ready for any needed operation. The drug in these cases acts like a tonic. It makes old people feel better, gives them better appetites and generally gets them in better shape.

Elderly patients with thrombophlebitis, allergic asthma, chronic skin disorders and inflammatory eye conditions can also be helped by short courses of ACTH or cortisone.

The way to make a small amount of ACTH go farther, Dr. Thorn said, is to give an infusion into the veins over a six-hour period. With this method a 20-milligram dose becomes the equivalent of about eight to 10 times that amount, he said.

Science News Letter, March 24, 1951

METEOROLOGY

Spring Is To Start Colder Than Usual

▶ THE BEGINNING of spring will be colder than usual this year. The Weather Bureau's Extended Forecast Section says that temperatures will average below seasonal normal up to mid-April, except in the Northeast and Southwest. In those areas the weather will be near or above normal in temperature.

Jerome Namias, chief long-range forecaster, declared that this was the most difficult 30-day predicting job he had ever done. The balance is delicate, he said, and it can go one way or the other.

It will be a rainier than usual month in the Midwest and the Pacific Northwest. The rest of the nation will have either the usual amounts of rain, or less than usual.

Science News Letter, March 24, 1951

Iguassu Falls, on the border of Argentina and Brazil, surpass Niagara Falls in both height and width.

For every 100 women dying of *cancer* in 1900 there were only 60 male deaths; today more men die of cancer than women.

The colored *peccary* of Arizona, not a pig but sometimes called a wild one, is at home among the desert cactus or mountain evergreens.

EXPLORE the SECRETS of the ATOM

with the New GILBERT

ATOMIC ENERGY LAB

$49.50 complete with all this equipment:

- Geiger Counter*
- Wilson Cloud Chamber
- Spintheriscope
- Neutron & Proton Spheres
- Electroscope
- Four Radioactive Ores
- Alpha, Beta, Gamma, Radioisotopes from Oak Ridge
- Gilbert Atomic Energy Instruction Booklet—60 Pages! Illustrated. Nuclear Physics made simple and exciting! Also 2 other books!
- Size of set 25" x 16½" x 5"

For classroom demonstration
For home experimentation
Instructive—Educational—Safe

* Geiger Counter alone $19.95

The RADIAC Co., Dept. GM-2, 489 FIFTH AVENUE, NEW YORK 17, N. Y.

MARINE BIOLOGY

NATURE RAMBLINGS

Hermit Crab

➤ CRABS are delicacies of the dinner table, usually served, for the sake of "atmosphere," cooked and stuffed back into their own shells. The edible crabs of the world belong to a relatively small group of species. The inedible kinds of crabs outnumber the species of positive economic value many fold and include a host of species of interesting and often weird appearance.

Among these are the hermit crabs. They are not really crabs at all in the true sense, although they have been given that name in common parlance. They probably originated from burrowing ancestors whose tails had become soft and flexible. When they gave up burrowing, they had to protect their tails by pushing them into shells.

The hermit crab can often be seen among the rocks during a seaside vacation. In spite of the name, it cannot be truly said to have a crusty disposition, except perhaps about its head and claws. This lack of the natural crust with which all other crabs are endowed is what determines its peculiar custom of inhabiting the deserted dwellings of departed sea snails.

If you see a small curled sea-shell hustling along in a shallow tidal pool, at a good deal faster clip than its proper owner could ever have carried it, the present tenant is almost certain to be a hermit crab. If you capture such a shell and try to pry the little creature out, you will have no luck, for the crab sticks as tight in the shell as did the snail that grew in it originally. If you persist, you can pry the crab out—but it will be in pieces.

Hermit crabs grow, just as other crabs do, but instead of cracking a shell and molting, or shedding it, the hermit must abandon his adopted quarters when they begin to cramp him and seek new ones. This is because his body is permanently in the unprotected "soft-shell" state. The search for new living quarters is a time of anxiety for the temporary-homeless crab. Sometimes, two houseless hermit crabs, happening simultaneously upon a suitable empty shell, will stage a fierce battle for its possession. For this pugnacity, the species is sometimes called the soldier crab.

Science News Letter, March 24, 1951

OVER 700 ELEMENT FACTS ON THIS NEW DATA RULE!

The Elemental Slyd-Rul gives concise information on the physical properties of the 96 elements: symbol, weight, density, etc. Ideal for students. In durable Vinylite. Money-back guarantee.

$1.00 POSTPAID, No C.O.D.'s

The Slyd-Rul Co., Canaan, N. Y.

ARCHAEOLOGY

Whistling Jar a Clue

➤ AN ANCIENT double pottery jar that whistles as liquid is poured from one side to the other may provide scientists with a clue to the connection between early peoples in America.

The whistling jar was just brought to the Southwest Museum in Los Angeles from Peru. It is the work of early residents of Peru, probably of the Chimu period.

The jar is black and the twin bowls are shaped and indented with "eyes" to represent potatoes. They are joined at the base by a heavy tube and have long necks resembling a modern water carafe. One neck is open, the other, which emits the whistle, is closed by two modeled figures seated on top. These depict a medical scene. A surgeon is extracting from the foot of a boy the egg sack of the sandflea. This insect is a common pest along the coast of Peru. If the egg-sack is not removed before the eggs hatch, an infection may result which is serious enough to cause the loss of the foot.

The humor of the artist is revealed by the expressions on the faces. The surgeon is described as being in "almost diabolical good spirits while the patient with pursed lips simulates indifference.

When the jar is tilted so that the water runs from one side to the other a clear whistling sound is given out at a vent at the base of the seated figure.

Such an ingenious and elaborate device as this whistling jar is not likely to have been invented twice, it is pointed out by Dr. George W. Brainerd, in reporting the acquisition in THE MASTERKEY (Jan.-Feb.).

The fact that similar whistling jars have been found in Middle America, dated as between 2,000 and 3,000 years old, points to some interchange between the people of Middle America and Peru in early days.

Science News Letter, March 24, 1951

PSYCHOLOGY

Use Old People Wisely

➤ A PRACTICAL approach to the problems of old age, for the sake of the nation and its oldsters and their families, was urged by Dr. E. V. Cowdry of the Washington University School of Medicine, St. Louis.

We should "keep our eyes glued on the main chance," Dr. Cowdry declared in his keynote address at the opening of the second medical research conference on the Clinical Problems of Advancing Years in Philadelphia. The conference was sponsored by Smith, Kline and French Laboratories.

Without belittling "what is commonly known as fundamental research," Dr. Cowdry nevertheless insisted that we should try to distinguish between what has the most and the least utilitarian value. Otherwise any direction of research on problems of aging will be "altogether superfluous," he declared.

The nation's oldsters are facing a call to serve their country today as they did during World War II. But to avoid haphazard and thoughtless use of these additions to our man and womanpower pool, we need a simple effective test for determining the working capacity and aptitudes of individual old men and women.

In 1890, Dr. Cowdry reminded doctors at the conference, 70% of the men and women over 65 years were employed. In 1950, it is estimated that only about half this proportion, or 36%, were employed.

Intelligent employment of old people, Dr. Cowdry said, will not only benefit the nation but will improve morale of the old people, relieve their families of strain and probably reduce the demands on the medical profession. With large numbers of younger physicians being called to military service, this last effect becomes more important than ever.

Science News Letter, March 24, 1951

Silica sand, suitable for making the best grades of glass, is to be obtained near Ottawa, Canada, from deep underground sandstone in the region.

A British merchant vessel is being equipped with *gas turbine* power, marking a forward step in the use of this type of engine in marine applications.

• Books of the Week •

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWSLETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publication direct from issuing organizations.

AEC CONTRACT POLICY AND OPERATIONS—Atomic Energy Commission—*Govt. Printing Office*, 158 p., paper, 40 cents. Part one reports what is not classified about progress and activities in research programs. Part Two gives information of value to universities and other research institutions that might have contracts with AEC.

ATOMIC ENERGY AND YOU—*Los Angeles City School Districts*, 47 p., paper, 25 cents. representing a synopsis of the Civil Defense training courses given at the University of California at Los Angeles.

BASES OF HUMAN BEHAVIOR: A Biologic Approach to Psychiatry—Leon J. Saul—*Lippincott*, 150 p., illus., $4.00. Introducing psychiatry as a part of biology and physiology. The author points out that man, living today physically in the Atomic Age, lives emotionally in the Stone Age.

FROM THE LIFE OF A RESEARCHER—William Weber Coblentz—*Philosophical Library*, 238 p., illus., $4.75. The charmingly written autobiography of a well-known physicist who specialized on the study of thermal radiation.

GEOGRAPHY OF RUSSIA — N. T. Mirov — *Wiley*, 362 p., maps, $6.50. The author, a Russian-born lecturer at the University of California, gives many interesting details regarding this little-known land. Did you know, for example, that in Russia the "eye" of a needle is called its "ear," and a "blind street" is there called a "deaf street"?

THE IMPACT OF SCIENCE ON SOCIETY—Bertrand Russell—*Columbia University Press*, 64 p., $2.00. "Science," the author says, "offers the possibility of far greater well-being for the human race than it has ever known before . . . on certain conditions—abolition of war, even distribution of ultimate power, and a limitation of the growth of population."

INVENTORIES OF APPARATUS AND MATERIALS FOR TEACHING SCIENCE: Volume II, Universities—*UNESCO (Columbia University Press)*. 144 p., paper, $2.00. Science course content and teaching apparatus used, prepared to serve as a guide in educational rehabilitation and an aid in bringing about equivalence of degrees and diplomas.

INVENTORIES OF APPARATUS AND MATERIALS FOR TEACHING SCIENCE: *Volume* III, Technical Colleges, Part I Veterinary Sciences—*UNESCO (Columbia Univ. Press)*, 97 p., paper. $1.20. Courses taught in various countries and material and apparatus needed, published as an aid in bringing about equivalence.

THE JOY OF FLOWER ARRANGING—Helen Van Pelt Wilson, Ed.—*Barrows*, 252 p., illus., $3.95. A beautifully illustrated book for the beginner or the ribbon winner. A chapter by a gifted arranger for each month of the year.

THE LAST GREAT HOPE—Tom Slick—*Naylor Co.*, 75 p., $2.00. The author describes his own plan for avoiding war.

NATIVE ORCHIDS OF NORTH AMERICA NORTH OF MEXICO—Donoval Steward Correll—*Chronica Botanica*, 399 p., illus., $7.50. An artistic volume for orchid growers and lovers as well as for botanists and horticulturists.

PROJECTS IN GENERAL METALWORK—M. J. Ruley—*McKnight*, 78 p., illus., $2.00. How to make a variety of useful articles for the home, with blueprints, list of material required and steps in construction.

THE STORY OF METALS—John W. W. Sullivan—*American Soc. for Metals and Iowa State College Press*, 290 p., illus., $3.00. Answering in readable style many questions of the layman and his young son.

STUDIES IN LATE TERTIARY PALEOBOTANY—Daniel I. Axelrod—*Carnegie Institution of Washington*, 323 p., illus., paper, $2.75, cloth $3.25. Includes four papers dealing with Pliocene floras in California and two discussing theoretical problems.

A STUDY OF CLASSIC MAYA SCULPTURE—Tatiana Proskouriakoff—*Carnegie Institution of Washington*, 209 p., illus., paper, $5.75, cloth $6.25. A method of stylistic analysis for use in estimating the relative dates of Maya monuments. Contains a list of monuments with their estimated dates.

TEXTBOOK OF ANATOMY AND PHYSIOLOGY—Catherine Parker Anthony—*Mosby*, 3d ed., 614 p., illus., $4.00. Revised to include considerably more physiology because of its increased emphasis in the training of nurses.

TEXTBOOK OF PHYSIOLOGY AND BIOCHEMISTRY—George H. Bell, J. Norman Davidson and Harold Scarborough—*Williams & Wilkins*, 918 p., illus., $9.00. An introductory text for medical, pharmacy and other students. The work is the result of collaboration between a physiologist, a biochemist and a clinician.

THIRTY-SIXTH ANNUAL REPORT OF THE NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS 1950—NACA—*Govt. Printing Office*, 69 p., paper, 40 cents. An administrative report without technical reports.

VIRUS AND RICKETTSIAL DISEASES—S. P. Bedson, A. W. Downie, F. O. MacCallum and C. H. Stuart-Harris—*Williams & Wilkins*, 383 p., illus., $5.50. Written mainly from the aetiological point of view with emphasis on the diagnostic aids that the laboratory can give to the clinician. Of British authorship.

THE WAY TO SECURITY—Henry C. Link—*Doubleday*, 224 p., $2.50. A psychologist writes on how to attain psychological and spiritual security.

MEDICINE

Cancer Clue Comes From Shock Research

➤ CLUES to the essential nature of the transformation of normal cells to cancer cells are coming, "somewhat surprisingly," from research on shock carried on by the Sheffield Traumatic Shock Team and reported by Dr. H. Green and M. Savigear of the University of Sheffield in the British Medical Journal (March 10).

Cortisone and ACTH, famous chemicals that relieve crippling and pain in arthritis, have played a part in unearthing the clues to cancer formation.

Cortisone and shock and, probably, ACTH all have the power to stop the process of cell division called mitosis, the Sheffield scientists found. The cells of mouse skin were the kind studied.

When, however, the mouse skin was painted with a cancer-causing chemical, the skin became refractory to the anti-mitosis action of shock and cortisone. The cells went on dividing in spite of the cortisone or the shock given the animal. Various transplanted cancers were also insensitive to the anti-mitosis action of cortisone and shock.

This resistance to normal growth-regulating agents has often been assumed or claimed as a property of the cancer cell. Even the layman is likely to speak of the "wild" or "uncontrolled" growth of cancer. But, the Sheffield scientists state, "the property has never been precisely demonstrated experimentally."

"It may be that this work not only reveals the existence of such a property but offers an approach to an elucidation of its nature," they declare.

Cortisone and shock, they believe from their studies, check cell division, or mitosis, by interfering at one or more stages of the body's utilization of sugars and starches.

Science News Letter, March 24, 1951

Grass and *weed killing chemicals* are replacing the man with the hoe in American cotton fields.

The *whooping crane* is one of the nearly extinct species; 32 were counted in Texas in a recent aerial survey.

The leafy wastes of many vegetables can be converted into high-quality *feed* for farm animals by a drying process.

EXAKTA "V"

35mm Single Lens Reflex Camera

One lens both for viewing and picture taking assures perfect sharpness, accurate exposure, maximum depth of field, and correct composition for color. You always see the exact image before you take the picture—whether the subject is an inch or a mile away whether it is microscopic or gigantic, whether it is moving or stationary. Instantly interchangeable lenses permit telephoto, wide angle, close-up, copy and microscope photography. **With f3.5 Zeiss Tessar "T" Coated Lens .....$180.00 plus tax**

Write Dept. 900 For Free Booklet "I"

NATURE PHOTOGRAPHY WITH MINIATURE CAMERAS by Alfred M. Bailey (Denver Museum of Natural History). This eminent explorer and scientist displays his finest Exakta photographs and others along with explanatory material. **64** pages **50c**

EXAKTA CAMERA CO., 46 W. 29th St., New York 1, N.Y.

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N ST., Washington 6, D. C. and ask for Gadget Bulletin 562. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

❁ *WRAPPING for meat to be roasted is made by a special machine for use in the market. This machine grinds fat into a fine mixture and extrudes the fat in a layer on moisture-proof cellophane. Such wrapping holds the juices in the meat during roasting and eliminates need of basting.*

Science News Letter, March 24, 1951

❁ *RUBBER FLASHLIGHTS, breakproof, waterproof and damage-proof, are claimed superior to types in metal cases because they will not injure furniture or other polished surface on which they may be laid. This new flashlight can be focused for either a wide beam or spotlight.*

Science News Letter, March 24, 1951

❁ *HEATER for ice-fishing, recently patented, is a circular, double-walled affair that fits around the sides of the hole cut through the ice and keeps the water within from freezing. Between the double walls is a tank for liquid fuel and also a series of burners.*

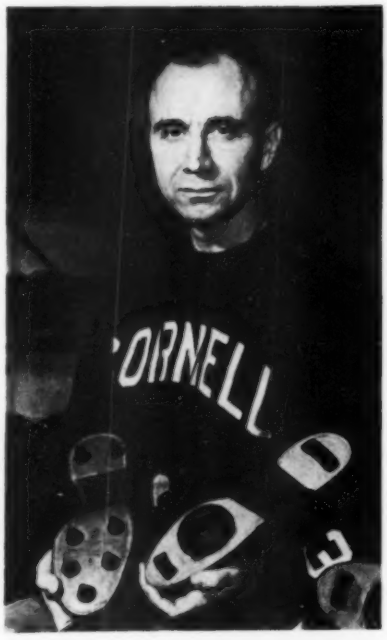
Science News Letter, March 24, 1951

❁ *VINYLITE wallets with electrically-welded seams and no stitching are available in various colors and various textures ranging from straw effect to woven ribbon effect. A detachable purse for change slips into the outside cover and snaps securely in place.*

Science News Letter, March 24, 1951

❁ *RING-CLEAT football shoe, designed to prevent injury from slips and falls, has a circular part under the ball of the foot where it offers least resistance to rotation. Curved toe and heel cleats, shown in the picture, are arcs of circles with the same center as the ring.*

Science News Letter, March 24, 1951



❁ *MAGNIFYING glass, for the naturalist in the field or even the fisherman in "baiting" his line, is hinged to a base that is worn flat on the chest. When this recently patented device is not in use the glass lies against the base but, in use, it projects to the front between the eyes and object under examination.*

Science News Letter, March 24, 1951

❁ *CHAMOIS substitute, for car and window washing and all sorts of household cleaning, is made of a long-wearing, non-woven fabric impregnated with a special latex, and looks, feels and absorbs water like the natural products. It wears three times longer, however, and will cost much less.*

Science News Letter, March 24, 1951

❁ *HOME-MADE "electrified curtains" on casement windows solved the cold-weather problem of an Erie engineer who sewed heating wire, electric blanket type, in loops on the lower part of the curtains. To eliminate fire hazard, proper wattage and voltage were checked by him with scientific instruments.*

Science News Letter, March 24, 1951

Do You Know?

Columbus took 70 days to cross the *Atlantic;* planes now take less than a single day.

Grain *sorghum,* rapidly becoming an important American crop, provides feed for livestock either as grain or forage.

Limestone is used in blast furnaces to remove impurities from iron ore and in steel-making furnaces to remove impurities from pig iron.

Tungsten is an essential metal in the manufacture of cutting tools, in the filaments of electric lamps, in armor plate and armor-piercing projectiles.

Special COMBINATION SALE

USE OF TOOLS and KNOTS AND ROPE

$1.98 Per Set

TWO CLOTH-BOUND BOOKS that will help anyone in repairs around the house, shop or laboratory. How to use tools for measurement, woodworking, painting, metalworking, soldering, wire splicing. Knots and rope for everything from tying a package to mooring a ship. Photographs by Fremont Davis and text by Marjorie Van de Water, Science Service staff.

Phototold in over 600 vivid photographs. Only 200 sets available at $1.98 per set, reduced from $5.50.

To: Science News Letter, 1719 N St., N. W., Washington 6, D. C.

Send me_____combination sets (USE OF TOOLS and KNOTS AND ROPE) @ $1.98 each, postpaid. My name is imprinted to the right.

SCIENCE SERVICE
1719 N Street N. W. • Washington 6, D. C.

Clip and enclose this address imprint whenever you write us to renew your SCIENCE NEWS LETTER subscription, change address, order other materials, etc. It identifies you as one of the SNL family. Lower line date is expiration. Allow three weeks for address change.

UNIV OF MICHIGAN
THE OBSERVATORY
ANN ARBOR MICH
'52 4-24 414-137